UNIVERSITI TEKNOLOGI MALAYSIA

SECI2143

PROJECT 1

DATA ANALYSIS (DESCRIPTIVE STATISTICS)

How Proficient First-Year Students are with Technology in Learning

SECTION 6 - GROUP 10

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INTRODUCTION

Technology is an application of scientific principles in everyday observations to make life simple and more convenient. Today we rely on technology for carrying out our everyday work. It has become an integral part of our way of life. Nowadays, technology in education is really important as it helps students to offer various tools to boost development and to exchange information. Our group is really interested to know how proficient students nowadays are with technology regarding their course as they need to use it for future working phase.

The purpose of this survey is also to observe how pandemic covid 19 really changes students capabilities in technology. For example we can see every institution using various platforms such as Webex, Zoom and Google Meet to deliver their knowledge to students. Furthermore, students also need to use technology to source information from the internet for their additional knowledge or assignments. Some students have been exposed to technology since primary school but some students are not. It also will cause the difference in capabilities among the students.

At the end of the observation, we are expecting the majority of the science computer students are more capable in technology than other courses in UTM. On the other hand,we also expect that students who have been exposed to technology at an early age have no problem with changes in learning methods.Moreover, we expect that the rate university's use of technology in learning and teaching also influenced the student current CGPA. We also prepare some questions regarding the skills in computer-related activities to determine the capabilities of students. The questionnaire has been distributed to all first year students in UTM.

DATA COLLECTION

For this project, we require primary data collection. Primary data is the data gathered by the researcher, us directly from the main source, which is the survey respondents. The title of our project is 'How Proficient First-Year Students are with Technology in Learning' and we plan to collect the response from First Year University of Technology Malaysia students. There are several parts of our survey, first is collecting the respondent's profile, next is technology usage in their life and last, their opinion about technology.

There are several parameters and variables to be measured. First, we want to collect the respondent's age. From this, we can measure the parameters of the age such as mean, median, mode and range of age. Next, CGPA and their respected school or faculty. CGPA is a continuous, quantitative and ratio data while faculty is qualitative and nominal data. From these data, we can observe the general demographic of First-Year students who answer our survey.

Next variables are the duration of technology usage and since what age they have been using technology. Both of these data are quantitative. We want to collect the respondent's duration of technology usage per day in hours and the age number they start using technology. This will provide us with the general idea of how technology literate are our respondents. With this information, we can calculate the mean, median and mode of these variables.

Other variables are owned electronic devices and online teaching tools they are familiar with. These data are qualitative and nominal. We want to see what electronic devices these respondents have, such as smartphones, laptops, personal computers or others. For online teaching tools, we want to be able to gain the knowledge of what software tools UTM students are familiar with. We predict the more tools they are able to use, the more proficient they are in technology.

After that, their rating for university's usage of technology. This variable is likert scale and ordinal, which includes rating from 1 (bad) to 5 (excellent). The other variable is the respondent's rating about their overall proficiency in technology. This data is also ordinal, which is a rating from 1 (bad) to 5 (excellent).

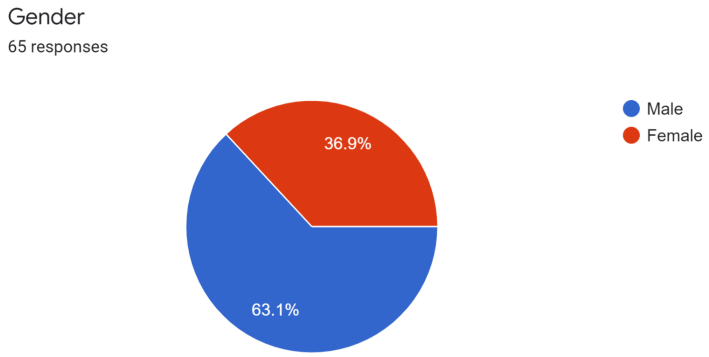
We also want to collect respondents' opinions about their skills in technology. Therefore, we asked them to rate themselves in several technological skills. The ratings are; no idea, weak, average, good, expert. This gives us a brief idea about their proficiency in technology. Lastly, we asked their opinion on technology usage in learning. For example, to what extent they agree that technology makes them feel connected to lecturers, and many more. Both these variables are like scale variables.

From this variable and data, we can make inferences and calculate parameters such as mean, mode, median, variance and range. For example, we can find the average and variance of how long UTM students use technology in their daily life.

After deciding on the variable and discussing it together, we chose to distribute a survey to collect data from First-Year UTM students. We decided to use Google Form as a platform to distribute the survey. After finishing setting up the survey in Google Form, we share the link to UTM students through Telegram and Whatsapp.

DATA ANALYSIS

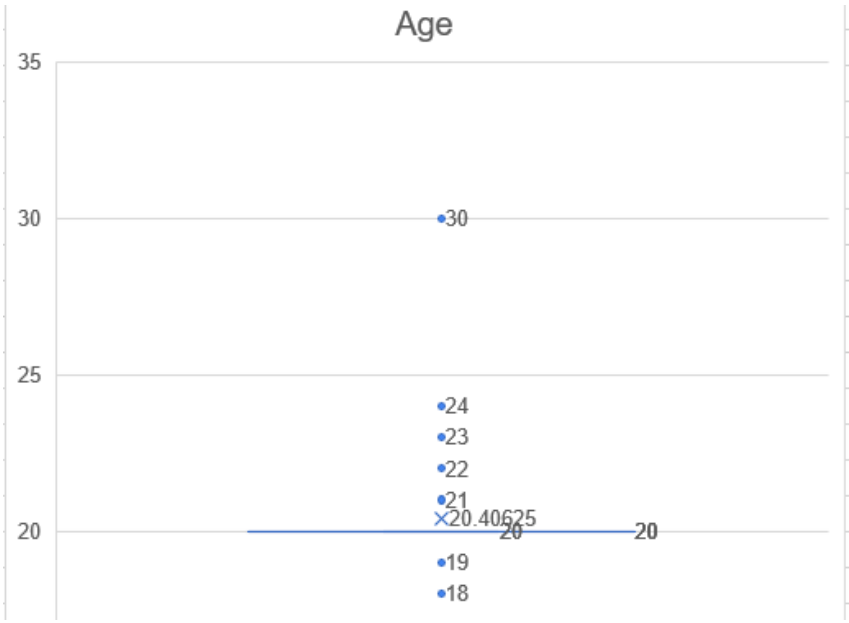
Pie Chart



The total number of respondents, which is equivalent to the sample size, is 65.

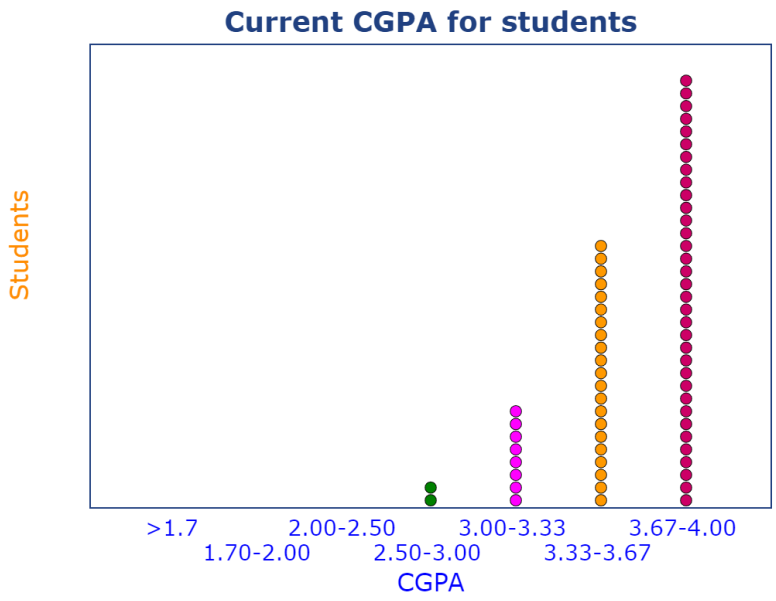
From this chart, we can compare the shape and see that about ⅓ of the chart is red colored for females and about two thirds of the chart is blue colored for male. Out of all respondents, male is at 63.1% while female is at 36.9%.

Box Plot



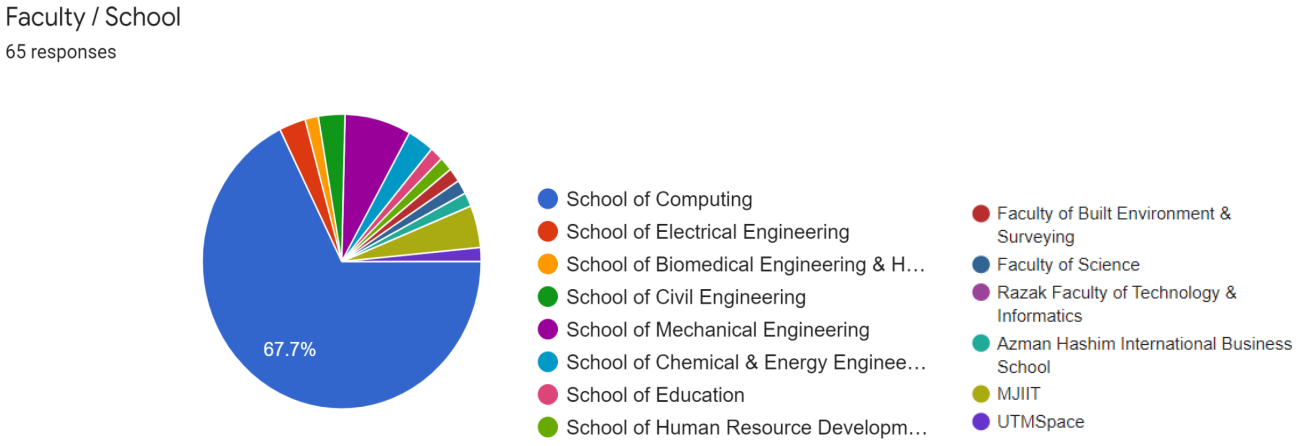
From this box plot of respondents' age, it is shown that the 1st quartile and the 3rd quartile are at the same value of 20 years old which also indicates that the median is also at 20 years old. However the mean for the ages of the respondents is 20.40625. Lastly the maximum age of the respondents is 30 years old while the minimum age is 18 years old.

Dot Plot



From this chart, most of our respondents got a good result which is CGPA 3.67 to 4.00 with 34 students while the least respondents got 2.50 to 3.00 with only 2 students from their previous exam result.

Pie Chart

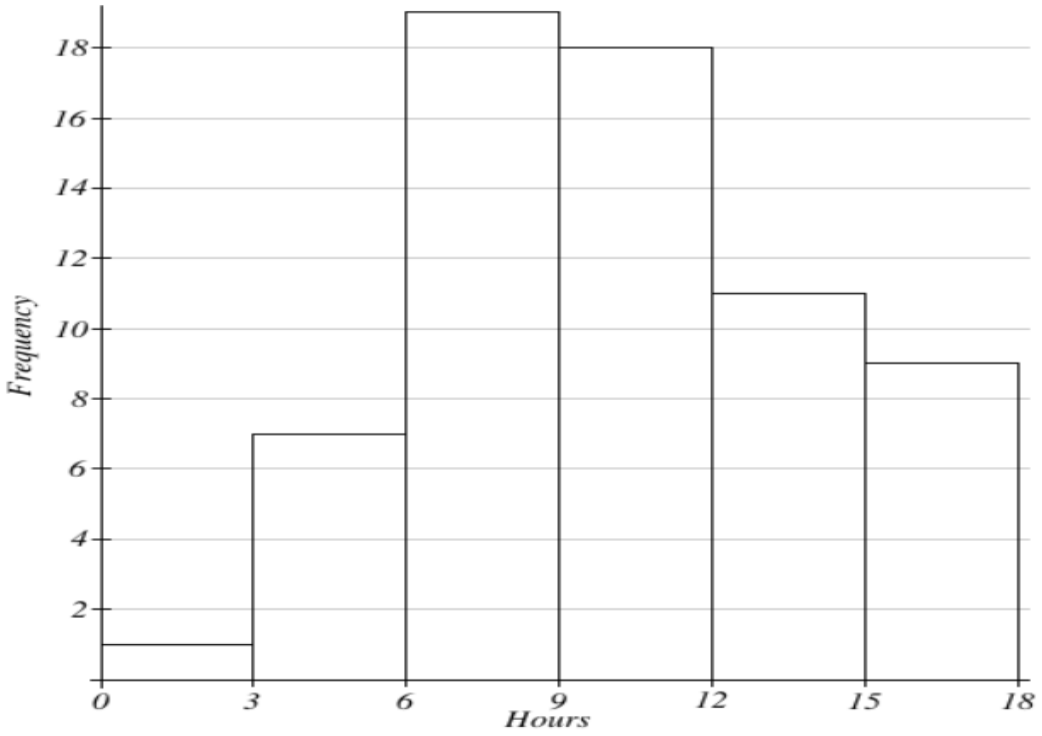


From this chart, the blue colored chunk has the biggest percentage out of all colors. The blue colored chunk represents the students from the School of Computing. Most of the respondents are School of Computing students (67.7%) which equals 44 respondents, followed by School of Mechanical Engineering (7.7%) and Malaysia-Japan International Institute of Technology, MJIIT (4.6%).

Cell Frequency and Histogram

Class Interval	**Frequency, *f***	**Cumulative Frequency, *cf***	**Midpoint, *x***	x^2	***f(x)***
0-3	1	1	1.5	2.25	1.5
3-6	7	8	4.5	20.25	31.5
6-9	19	27	7.5	56.25	142.5
9-12	18	45	10.5	110.25	189.0
12-15	11	56	13.5	182.25	148.5
15-18	9	65	16.5	272.25	148.5

In estimation, how long do you use technology (electronic devices) per day?



$$Mean,\ \bar{x} = \frac{\sum_{i=1}^{h} fiXi}{n}$$

$$= \frac{1.5+31.5+142.5+189.0+148.5+148.5}{65}$$

$$= \frac{661.5}{65}$$

$$= 10.18$$

$$Mode = l + h \times [(f1 - f0) \div (2f1 - f0 - f2)]$$

$$= 6 + 3 \times [(19 - 7) \div (2(19) - 7 - 18)]$$

$$= 6 + 3 \times 0.92$$

$$= 8.76$$

$$Median = L + \frac{\frac{N}{2} - cfp}{fmed}(w)$$

$$= 9 + \frac{32.5 - 27}{18}(3)$$

$$= 9 + 0.92$$

$$= 9.92$$

$$Variance, s^2 = \frac{\sum_{i=1}^{n} (xi - \bar{x})^2}{n-1}$$

$$= \frac{(1.5-10.18)^2+(4.5-10.18)^2+(7.5-10.18)^2+(10.5-10.18)^2+(13.5-10.18)^2+(16.5-10.18)^2}{65-1}$$

$$= \frac{165.84}{64}$$

$$= 2.59125$$

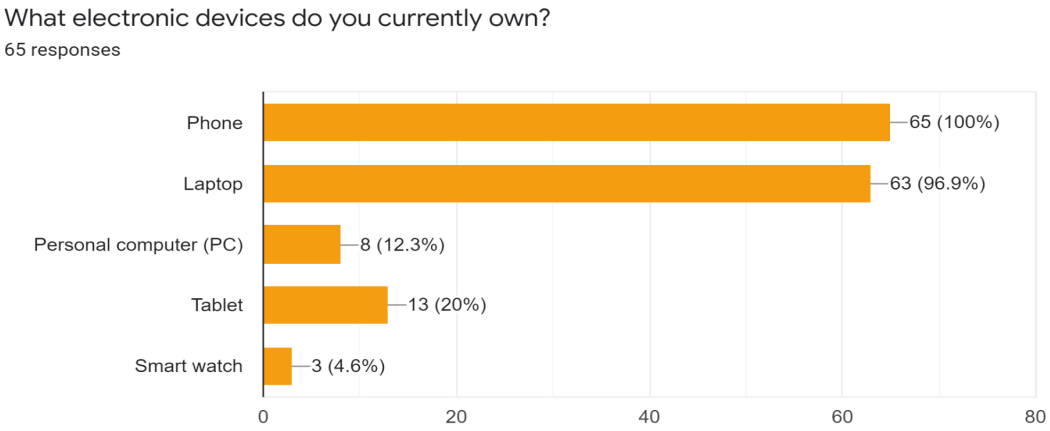
$$Standard\ Deviation,\ s = \sqrt{s^2}$$

$$s = \sqrt{2.59125}$$

$$s = 1.6097$$

From this histogram, we can calculate that the mean of technology usage (hours) per day is 10.18, the median is 9.92 and the mode is 8.76 hours. After that, the variance is 2.59125 and the standard deviation is 1.6097.

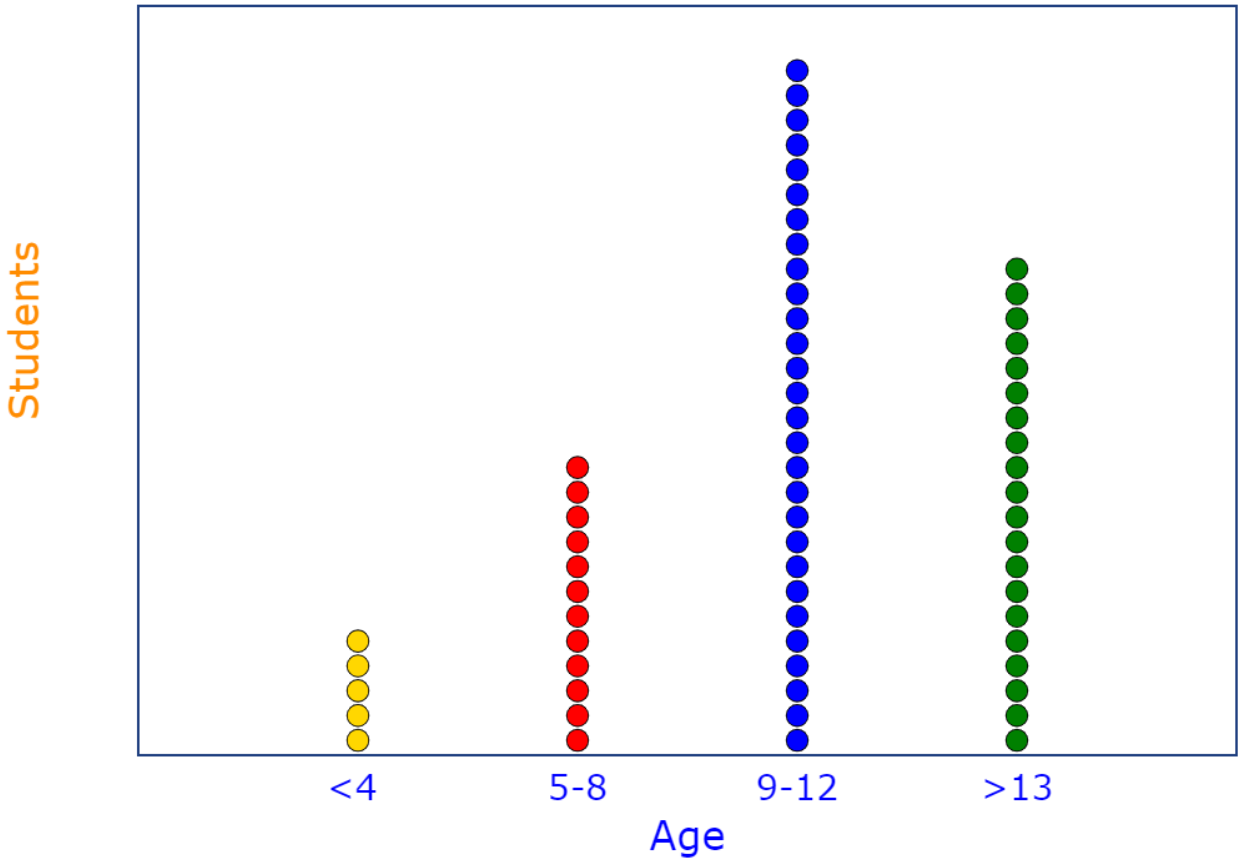
Bar Chart



From this chart, we can see that most of the respondents have a laptop and phone which is 65 (100%) and 63 (96.9%) respectively. Also, all the respondents are using phones for their learning which is 65 out of 65. The least electronic devices that are being used by the respondents is the smart watch which is only 4.6% (3 respondents only).

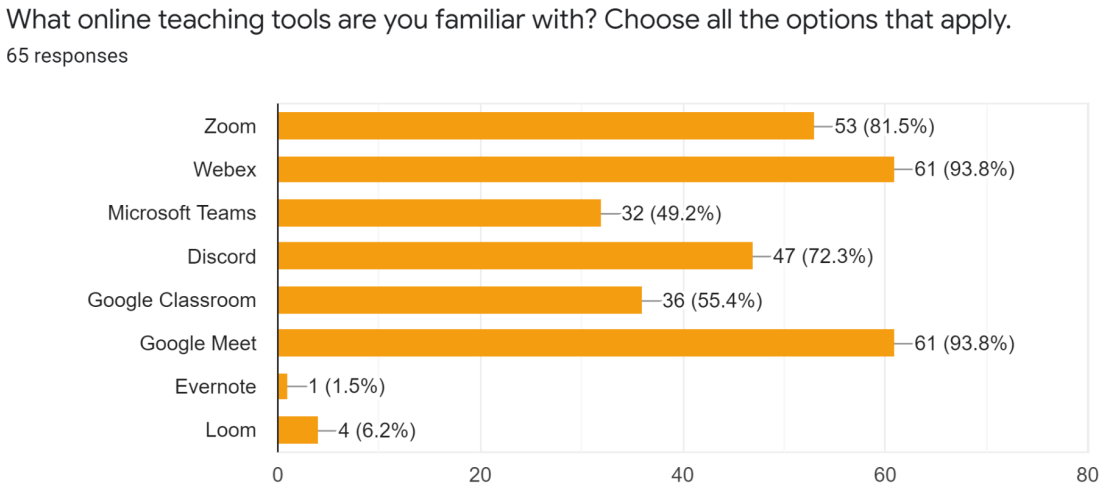
Dot Plot

Since What Age Have Students Used Technology?



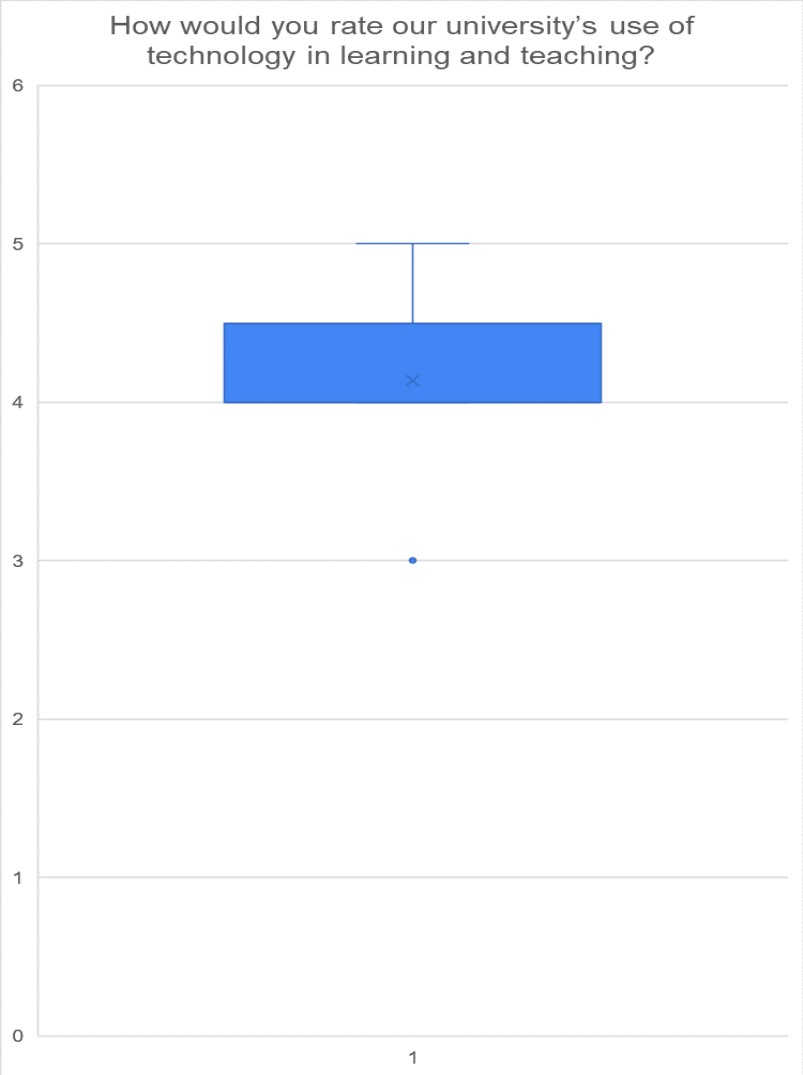
From this given dot plot, we can observe that students mostly started to use technology around the age of 9 to 12 years old with 28 respondents, while the least at the age of less than 4 years old with only 5 respondents.

Bar Chart



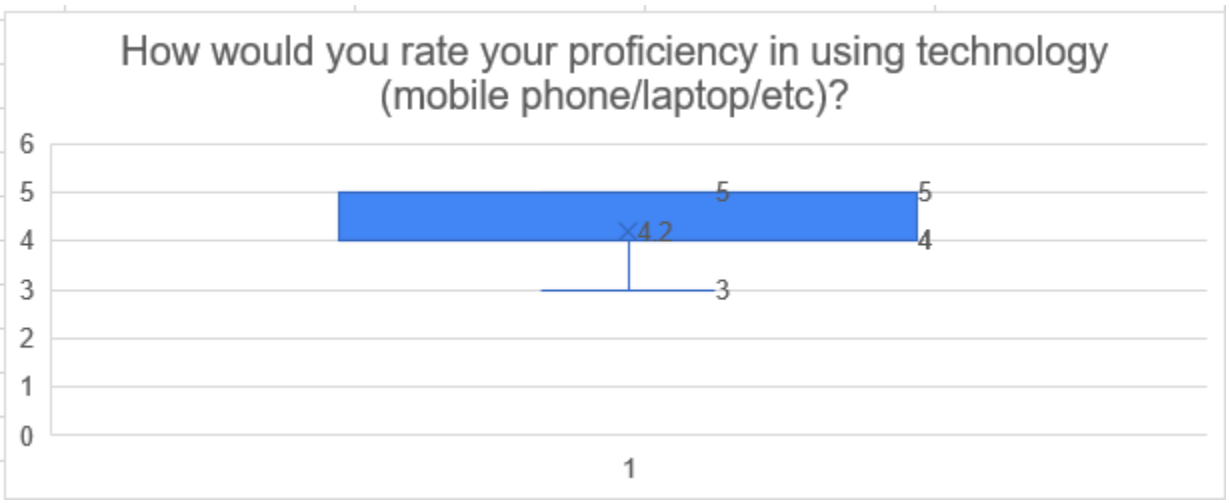
From this graph, we can see that respondents are mostly familiar with Google Meet, Zoom and Webex, while Evernote is the least familiar software among the respondents. 61 respondents are familiar with Webex and Google Meet. After that, out of 65 respondents, 53 of them are familiar with Zoom. 36 respondents familiar with Google Classroom, 32 respondents familiar with Microsoft Teams. Only 1 respondent is familiar with Evernote.

Box Plot



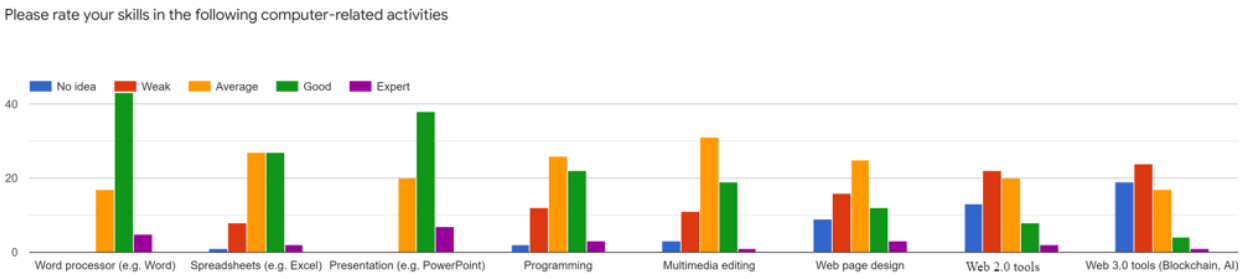
Most of the respondents rated 4 out of 5 for the university's use of technology in learning and teaching. As seen from the boxplot above, the mean for the rating is 4.14, the Q1 is 4, median is 4, and Q3 is 4.5. IQR is 4.5 - 4 = 0.5. There is an outlier, which is 3.

Box Plot



From this box plot, it is observed that the students' minimum rate of proficiency in using technology such as mobile phones and laptops is 3 while the maximum rate is 5. Furthermore, we can also see that the mean rate of students' proficiency in using technology is 4.2. Lastly, the 1st Quartile for this data is at 4 while the 3rd Quartile is at 5.

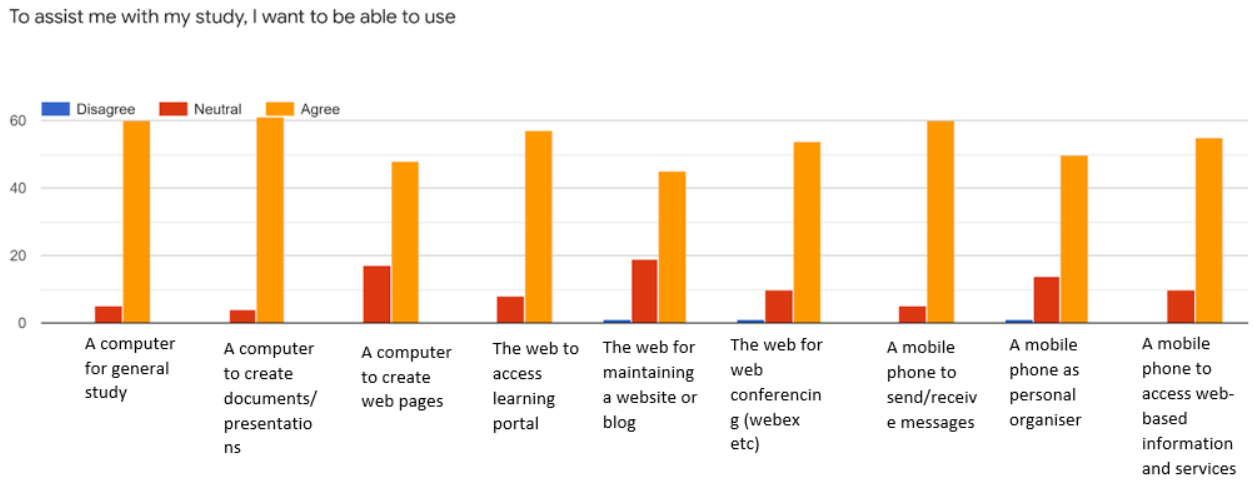
Comparative Bar Chart



From this graph, we can see that most respondents are good or average at using word processor, spreadsheets and presentation. But for programming, multimedia editing and web page design, most respondents are average in these activities. For example, 43 respondents are good at using

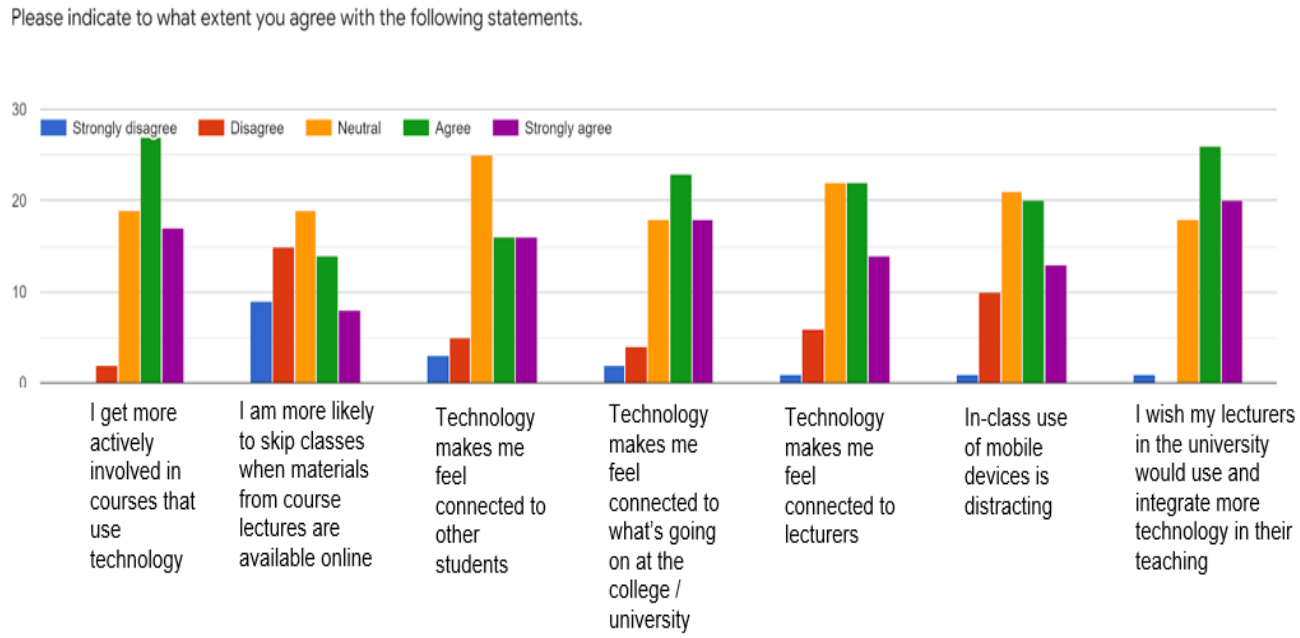
word processor, 17 are average while 5 are experts. Next, 26 students are average in programming, 22 are good at it, 3 experts, 12 week and 2 respondents have no knowledge of programming. For web 2.0 and 3.0 tools, a lot of respondents are weak at it. For example, most students are weak in web 2.0 tools with a total amount of 22 respondents. For web 3.0 tools, 24 are weak, 19 have no knowledge about web 3.0, 17 are average, 4 are good at it and only one respondent are expert in web 3.0 tools.

Comparative Bar Chart



From this graph, we can see that the orange bar is most of the time taller than the red and blue bar. Most students agree that they want to use technology for learning whether using a computer, the web or a mobile. For example, 60 respondents agree that they want to use computers for general study, while 5 people disagree that they want to use computers for general study. After that, 48 respondents agree that they want to use the web for maintaining a website or blog, 19 respondents are neutral while 1 respondent disagrees. Next, 50 respondents agreed that they want to use mobile phones as personal organizers, 14 respondents were neutral and 1 respondent disagreed.

Comparative Bar Chart



Based on the above chart, we can see that most of the students agree with the course and lecturer that use technology for its activities and teaching method. Secondly, we can see that most students vote neutral for the statement " I am more likely to skip classes when materials from course lecturers are available online" . Next, most students are neutral that technology makes them feel connected to other students.

CONCLUSION

From the observation, we can conclude that the majority of students use technology daily to access university's portal, for study purposes, social media and listening to music. On the other hand, 43.1% of the students have used technology from 9 to 12 years old which influenced their proficiency in technology. It also meets our expectations as we expected they have been exposed to the technology since they were in primary school. Moreover, about 29.2% of students spend about 6 to 9 hours using technology per day. They spent about half of their day using technology which is no longer a problem for students nowadays. Furthermore, some students have good skills in word processing, powerpoint presentation and excel spreadsheet but some students rate that they have neutral skills in programming, multimedia editing and web page design. From the observation, we can see students are quite familiar with Word and Powerpoint to assist them in learning by using computers. Most of the students agree they want to be able to use a computer for general study, to create documents/presentations, to access learning portals and others. From the observation, we can see people are neutral when they are asked about technology, which makes me feel connected to other students. Undeniably, technology makes people more isolated and makes them more introverted to each other. After conducting this survey, we learned how to brainstorm some interesting questionnaires so the respondents will not be bored. We also learned how to create and arrange google form so it will look tidy and nice. The most important thing is that we are able to strengthen our knowledge as we need to do some calculations and draw some graphs. Finally, technology is one of the industries that is growing more rapidly than any other worldwide and offering numerous career opportunities. Students nowadays need to make sure they are capable of some skills in these industries in order to secure jobs for their future.

REFERENCES

Our main reference paper:

Gregor E. Kennedy, Terry S. Judd, Anna Churchward, Kathleen Gray, Kerrie Lee Krause. 2008. First year students' experiences with technology: Are they really digital natives? https://ajet.org.au/index.php/AJET/article/view/1233/458

Our questionnaire google form :
https://forms.gle/uCgxE8kzWy7m1EtK7
https://drive.google.com/file/d/1lS8-3SdnJlMX1zaTwR7e7_alIcDMvwcP/view?usp=sharing
(pdf)

Our responses/spreadsheet:
https://docs.google.com/spreadsheets/d/1kNQJcm7We_G1-9pm9Q5NpSLfGNIlwpu_cl9ruxGACQ0/edit?resourcekey#gid=1536271918